



President's Message

by Tom Kinahan, N1CPE

We have a full slate of things to do as a club in the coming months including some of our biggest and best operating events, the **June VHF Contest** and **Field Day**. Let me know of your interest in the VHF Contest, as room reservations must be made early, and get all your rigs ready for Field Day. Why don't we try something silly this FD and operate 15A (15 simultaneous transmitters and emergency power)? That'll require 15 simultaneous operators, 15 simultaneous radios, and 15 simultaneous antennas. We'll need a BIG turnout and everyone must bring a complete station.... Are we up to it?

Elections

Elections for next years club officers will be held at the June 18th club meeting. The following is the slate of nominations:

- **President** - Tom Kinahan, N1CPE
- **Vice President** - Rita Baker, N1DDI; Mort Cohan, KA1IU
- **Corresponding Secretary** - Kathy Pate, KA1IYR
- **Recording Secretary** - Roger Smith, W1EOA
- **Treasurer** - C.J. McDonald, WB1BUM
- **Fund Raising Chairman** - Dave Kent, N2AWG; Thomas Burton, KX1H
- **Operations Chairman** - Vern Valero, ND1Z

If you can't make the election meeting in June, be sure to send us the enclosed form with your choices for these offices such that it arrives on or before June 18th in order to be counted. Note that write in candidates will be accepted, but that the write in candidate has the option of not accepting the office, in which case we will conduct an additional election at the earliest convenience to fill the vacant seat.

Field Day !

Plans for Field Day are becoming firm for the 26th and 27th of June at the Sprague School Field. This is the same place as last year. We'll begin setup at 11 am on Saturday the 26th and take down about 3pm on Sunday the 27th. Please stop by, and help set up, operate, and take down. Also be sure to catch the Wellesley A.R.S. FD barbeque on Saturday.

MEETINGS THIS MONTH: _____

June 4, 1987 at 7:30 P.M.

June 18, 1987 at 7:30 P.M.

211 Washington St., Wellesley

Please bring keyers, keys and headphones in addition to your radios and microphones.

We will be 15A this year, indicating 15 transmitters and emergency power.

See you there!

June VHF Contest

Plans are set for the June VHF contest expedition to Mt. Equinox Vermont. Join us up on the hill on June 13th and 14th for one of the premier operating events of the year. Directions can be sought from Tom Kinahan, N1CPE at 898-2749 and info on lodging can be gained from Vern Valero, ND1Z at 533-6822. If you can, join us on Friday the 12th and/or Monday the 15th for setup/takedown.

Please, if you plan on coming up, expect to arrive by 10am the 13th, with 4 hours drive from the Wellesley area. The auto road up the mountain will close soon after that for an antique auto race up the hill. Bring food (restaurant available), headphones, keyers and keys.

Wanted !

Low band Transciever, TS-430 or similar. Contact Dick Weissel, WA1HRV at 655-2366.

Announcement

We regret to inform you that Al Graf, W1OQP has passed away. Mr. Graf was a founding member of the Wellesley A.R.S. and was active in many local activities. He will be missed.

Net!

Don't forget the WARS net on the 147.63/03 repeater at 8pm local Wednesday nights.

Renewing Your ARRL Membership

If you're renewing your ARRL membership, please send your completed membership form and your check made out to the Wellesley A.R.S. to the club at 211 Washington St. Wellesley, Ma. 02181. We will then forward this to the ARRL on your behalf. This way, we are able to make \$2 from each renewal.

220 MHz Comments

As voted at the April 16th meeting, the Wellesley Amateur Radio Society is submitting comments on the reallocation on the 220-222 MHz (contin. P 3)

Calendar !!!

- *June 4* : W.A.R.S. Meeting
- *June 13-15* : June VHF Contest .. Mt. Equinox, Vt. .. FN33
- *June 18* : W.A.R.S. Meeting .. Elections .. Organizing for Field Day
- *June 26-27* : Field Day .. W1TKZ
- *July 24-26* : Heavy Hitters Hamfest Topsfield, Ma.
- *August 1-2* : UHF contest
- *September 12-14* : September VHF Contest .. Mt. Equinox, Vt. .. FN33
- *September 19* FCC Exam .. All Classes .. Wellesley Red Cross .. Special Events Station W1TKZ .. Our own version of Novice Enhancement Weekend !
- *September 26-27* : Amateur Radio at the Science Museum, Boston, Ma.

The Spark Gap

Official Journal of the Wellesley Amateur Radio Society
Editor:

Jon Freeman
17 East Meadow Road
Lowell, Ma. 01854



The Spark Gap is a monthly publication of the Wellesley Amateur Radio Society, its sole purpose is to keep its members abreast of current happenings, FCC rule & regulation changes and to list equipment offered for sale or trade by members. Members are encouraged to contribute to the Spark Gap and may send their articles to the editor's address or to the club address. Items printed in the Spark Gap may be reprinted by other Amateur Radio publications provided the author and the Spark Gap are given credit.

The Wellesley Amateur Radio Society is a non-profit organization dedicated to the promotion of Amateur Radio through instruction, fellowship, demonstration and participation. Annual membership in the society is \$10 and the club year runs from September 1 through August 31. Amateur Novice through Advanced classes are conducted regularly at no cost. To enroll in a class or gain information about the Society in general, write :

The Wellesley Amateur Radio Society
211 Washington Street
Wellesley Hills, Ma. 02181



amateur band. If you would like a copy of the W.A.R.S. comments, send us an SASE at the club address, and we'll send a copy right back out to you.

Public Service

We've been asked to help with medical communications for a Biathlon (running and biking) on Sunday May 31st. It involves simply looking out for participants that may have been injured and calling net control to get medical help. The bike portion of the race needs communications most, and it winds through the towns of Wellesley, Wayland, Weston, and a pinch of Newton. Contact Tom Kinahan, N1CPE at 898-2749 or on the air if you can help.

McDXing

Add a bizarre twist to your next trip to MacDonald's. Take along a hand-held scanner and monitor their drive-up window. 35.02 MHz is their McRepeater output; 154.6 MHz is the input freq. The input just carries the guy at the money window; the output carries the people in their cars, an alert tone when they drive up, and repeats the 154.6 freq. (These frequencies are good at the Milford and Framingham McD's, I haven't tried any others.) Would you like a Cherry Pie with your QSL?

by Bruce Fredrick, KA1FGY

Calling All Tentmakers!!

We are in dire need of medium to large sized tents for the Field Day effort. If you have a family-sized tent to help house a Field Day station, please contact Vern, ND1Z at 533-6822.

OFFICERS

President

Tom Kinahan, N1CPE, 898-2749

Vice President

Rita Baker, N1DDI, 481-0863

Recording Secretary

Roger Smith, W1EOA, 235-6239

Corresponding Secretary

Arthur Thompson, KA1ENP, 235-5509

Treasurer

C.J. McDonald, WB1BUM, 332-6091

Fund Raising

David Kent, N2AWG, 875-2126

Operating Activities Chairman

Bob Drapeau, KT1K, 883-1132

Education Chairman

Repeater Committee Chairman

Paul Davis, N1EGC, 646-3599

New Tickets

Bruce Fredrick	KA1FGY to General
Jon Freeman	KA1NDX to Advanced
Neil Grossman	KA1PPG to Technician
Tom Kinahan	N1CPE to Extra
Dave McLellan	N1DFP to Extra
Joel Sturman	KA1QIY Novice
Jim Topoli	to Technician
Jim Whitlock	to Technician

The May 2 FCC exam went smoothly due to the kind efforts of Dan KZ1D, Thomas KX1H, Frank NG1I, and Vern ND1Z. Dan has been organizing our exam sessions and has the process well in hand.

Free Software !!!

'Public Domain' software programs are written with the purpose of giving them away for general use. The author wants to share his/her work with others for free. This means that copies of this software may be made and the program passed on to friends. An amateur radio example of this is the packet bulletin board software written by WORLI.

Some Wellesley ARS members have public domain software that they would be happy to make copies for members. Below is a list of some of the ham radio public domain software and who to contact for information.

Contact Frank, NG1I for a copy of KERMIT. This program enables a Radio Shack color computer to communicate over telephone lines or send files to other computers running KERMIT. It may also be used for packet radio as a terminal emulator program. In other words, if you intend to use a Radio Shack computer for packet, this program may be what you need to get started. Please provide Frank with a floppy disk if you want a copy of the program.

Contact Nels, K1UR for a copy of a morse

code trainer that he wrote for the Apple II. Please provide Nels with a diskette.

Contact Vern, ND1Z for a copy of IBM PC ham radio software. There are three diskettes with 216 programs and data files. The applications include morse code, satellite calculations, RTTY, SSTV, antenna design, list of counties, DXCC tracker, contest helper, and great circle headings. Obtain a complete list at any club meeting.

If someone has public domain software to share with the group, please list in it the Spark Gap.

Nels, K1UR 872-5259

Frank, NG1I 655-8775

Vern, ND1Z 533-6822

THANK YOU !!

April 6, 1987

(Thank You) To the Wellesley Amateur Radio Society and most especially ND1Z, Vern, and all the other instructors of the Advanced upgrade class : NG1I, Frank; N1CPE, Tom; KX1H, Thomas; KA1NDX, Jon; NF1Z, Jed; KA1ENP, Art and KA1IU, Mort.

Many thanks for the loan of the video tapes you made of the Advanced class at the club (last) Fall. You all did a fine job teaching the material covered in the manual. The tapes were most informative and certainly helped me in my studies ! I am pleased to inform you that I finally took my Advanced Class Exam on March 26, 1987 and passed; got 100% !

Needless to say, I was thrilled to have done so well and I am thoroughly enjoying my new privileges as an Advanced Class operator on the HF bands ! Taping the classes was a wonderful

idea and perhaps future classes given at the club can also be videotaped so others can benefit as I have ! I am also very grateful for all the help I received from N1COY, Bob Downer, during the 6 months I was studying for my Advanced. He very kindly came to my home each week and most patiently and capably explained the concepts and formulas to me; he was great ! Special tnx to N1DDI, Rita, and KX1H, Thomas, for bringing the videotapes over to me; and especially to ND1Z, Vern, for being a VE at the last minute on the VEC team that administered my test ! You all are to be highly commended for your dedication to the promotion of this fine hobby of Amateur Radio !

73 & much appreciation

Kathy Pate KA1IYR/AA

Field Day Barbecue

Come one, come all to the annual Field Day barbecue on June 27 at 6 PM. It will be held right at the field day site between the tents and the antennas.

A barbecue grill and salads will be provided. Please bring your own meats and favorite beverages. Let us know if you plan to attend so that we can judge the amount of salads (potato, macaroni, toss) to make. Call Liz KA1PNA at 533-6822.

Book Review

"Get * CONNECTED To Packet Radio"**

by Jim Grubbs, K9EI

QSKY Publishing

"Get *** CONNECTED To Packet Radio" is an excellent source for learning how to set up a packet station, operate it, and understand how packet works. It is written for the semi-technical radio amateur who is interested in becoming involved in this new mode.

The instructions and advice about setting up a packet station are must reading even before a TNC is purchased. Close attention must be paid to detail in packet radio. K9EI makes a great effort to cover the necessary details. Unfortunately, the discussion of TNC's available on the market needs updating. This is understandable with the recent growth in new products.

The book is perhaps, a little weak in the area of operations. It does give the fundamentals, but could use more examples of packet operating customs. These procedures can be quickly learned by monitoring packet frequencies at peak traffic times.

An effort is made to explain the concept of packet radio networking and digipeaters. This discussion is a little abstract and could use more examples. Diagrams would also be useful.

The discussion of how packet radio works is excellent and targeted to folks without prior computer networking experience. Again, diagrams would be very useful. But K9EI keeps it general enough so that the concepts rather than the details can sink in.

There are nine appendices with very useful reference data. They contain such information as TNC command list, Bulletin Board commands, addresses of packet radio organizations, and a reading list.

"Get *** CONNECTED To Packet Radio" is

available for under \$ 10 from many of the amateur radio outlets. I ordered mine through "Ham Radio" magazine. It is now available in the New England ham radio stores. The book is a good investment for anyone thinking about becoming involved in packet radio.

by Vern, ND1Z

Computers And Amateur Radio

Part 5: Getting Started

In Packet Radio by Vern, ND1Z

The last installment of this series will describe what is involved in setting up a packet station. It will not explain the theory of how packet works or how one operates a packet station, only what is involved in getting a packet station on the air.

Why operate packet radio? Besides learning about digital communications, packet has a lot going for it. It is an error-free mode. Received information is not displayed until it is correct. It is also spectrum efficient. Due to the orderliness of the protocol, a single channel can support many concurrent QSO's. Finally, it is inexpensive to get started in packet radio these days. Many households already have home computers or terminals that can be used for display. The basic 'packet box' price ranges from \$ 120 to \$ 300.

Let us assume that the decision has been made to become involved in packet radio. I would first suggest 'playing' with either a friend's station or becoming involved in one of the frequent packet demonstrations given at Wellesley ARS meetings. This will give you the flavor of packet and an opportunity to learn some of the simple commands and procedures.

There are three major components to any packet station. They are the Terminal Node Controller (TNC), computer or display unit, and an amateur rig.

The TNC is a 'black box' that handles all the protocol aspects of packet communications. The TNC maintains connections with other stations, retransmits when necessary, and of course, chops your messages into packets. The TNC has a small computer inside with a program to make it all work. You communicate with the TNC with commands to do various actions. (Such as connecting to another station or listing out the callsigns of the stations that have been heard recently) There are a number of 'parameters', or values that can be adjusted to make communications smoother.

The question of which TNC to buy is open to debate. Some TNC's not only perform packet, but also RTTY, CW, and AMTOR. There is even one that will interpret weather satellite data and print it on your computer screen. For VHF operations the less expensive TNC's perform quite well. Buy a TNC that has a good reputation among your friends. There is no substitute for real experience.

You don't actually need a computer to operate packet radio. What is required is a terminal. The TNC performs all the work. It takes your inputs from the terminal keyboard and displays data to the terminal screen.

A good terminal can cost \$ 400 to \$ 1000. A home computer can cost as little as \$ 150 if an old TV set is used for display. So on a cost basis, one finds many home computers used as the 'terminal'. Of course, terminals are available on the used market. In any case, a terminal capable of generating the ASCII character set is required.

If you are using a computer as the terminal, you will need a terminal emulator program that makes your computer act as a simple terminal. These programs are available for purchase from ham outlets. You might choose to write your own emulator program. My TNC manual has listing of programs that can be run on some of the more popular home computers.

When starting the terminal emulator program or setting-up your simple terminal, be sure to pay attention to all the details. The TNC manual will instruct you on such terminal parameters as parity setting, baud rate, ASCII set, etc.

The amateur rig can be the one currently in your shack. VHF operations should be with an FM rig. HF operations require either the SSB or AFSK mode. Operating packet on HF is a little tricky and slower, so this discussion will be limited to VHF. Your VHF rig should be operated in the FM mode on simplex. It helps to have an antenna on the roof and moderate power, but that is not necessary. There will be other packet stations who act as repeaters or 'digipeaters' to help you out.

Let us assume that a TNC has been purchased. The first thing to do is to read through the manual in its entirety. Pay close attention to the installation procedures. Hopefully the TNC manual has specific instructions on how to hook-up your type of computer or terminal. Follow these instructions carefully.

We must tie together the TNC, computer (or terminal), and rig. Most TNC's come with the necessary cables. The drawback is that those cables only have connectors at one end, the TNC end. You must buy a connector for the computer end (a DB25 connector, or whatever your computer takes) and a microphone connector for the rig

end.

The Commodore and VIC computers, which are very popular in amateur radio, do not interface well with TNC's. A TNC expects signals in the RS-232 standard. The Commodores provide '1' and '0' with the TTL standard. There are a few ways to get around the problem. One is to build a converter to do the translation. Another is to buy the converter from a manufacturer such as Jameco. Some TNC's (such as Kantronics) optionally do the translation internally. You must remove the TNC cover and solder a jumper into place to select this option.

Most computers and terminals use RS-232 and the TNC's tend to expect this standard. In most cases it is necessary to tie-in only three lines of the RS-232 cable; 'Transmit-Data', 'Receive-Data', and 'Ground'. There are two other lines ('Clear-To-Send' and 'Request-To-Send') that the TNC manual might call for. You can try connecting them initially. These lines deal with controlling the flow of data. The TNC makes an assumption about how your computer handles this flow control. If the assumption is wrong, then you will not be able to communicate with the TNC. In that case, cutting the two extra lines should yield good results.

Connecting the TNC to the rig should be a snap, but it sometimes is not. The connections that are required are ground, audio-in, push-to-talk (PTT), and audio-out. Audio-out connects to the speaker jack of the rig. My VHF rig (Kenwood 7950) refers to the PTT line as the 'Standby' line. It might also occur to you that handheld transceivers do not have a jack for PTT. Some TNC's have a jumper for that case. Just wire the jumper and omit the PTT connection. Your TNC manual should provide advice for this case.

So let us assume that everything is hooked-up. The first step is to talk with the TNC. If the TNC manual specifies a certain baud rate between it and the computer, then set it up. Some TNC's have 'auto-baud' detection. On power-up you will see a message on the screen instructing you to type a certain character. The TNC detects the baud rate and now you are set. Now that you can talk with the TNC, use the command to permanently set the baud rate.

There are two operating modes of the TNC, command mode and conversation mode. In command mode, the commands described in the manual can be submitted. In conversation mode, messages that you type on the terminal are transmitted.

First we want to listen for packet messages. Tune to one of the popular packet frequencies such as 145.01, 145.03, 145.05, 145.07, or 145.09 Mhz. Set the TNC to the monitor mode so that we can eavesdrop. Adjust the volume control on the rig over several minutes until messages are seen on the screen. There is a command to list the callsigns of stations heard recently. If any callsigns are displayed, then the audio level is probably OK.

After a good deal of monitoring, take notice of a station that seems particularly strong. (if your rig indicates received strength) We will want to use this station as a digipeater to connect to ourselves.

Be sure to use the callsign command to set the call to your call-sign. The TNC automatically identifies for you on every packet, but it must know what your callsign is first.

Now we will attempt to connect to ourselves. If the strong station that was previously heard was W1XYZ, then submit the command

CONNECT (put your call-sign here) VIA W1XYZ. Soon you'll get a message: *** CONNECTED TO (your own call-sign). Now any text you type on the computer will go through W1XYZ and back to your station. Everything you type will eventually be echoed out on your computer. This is a good test of your packet station and when you are done, go back to the command mode perform a disconnect.

If you are having trouble connecting to yourself, there might be a few possibilities. The digipeater may not hear you well enough. Try connecting through several other stations. If there still is no success, then perhaps the audio tones from the TNC are not loud enough. The TNC manual should specify a resistor change to make the tones louder.

In any event, that is what is involved in setting-up a packet station. Good luck and we hope to hear you on packet soon!

Making Your First Packet QSO

By Tom Kinahan, N1CPE

When you make your first Packet QSO, there are a few things that you should know soon after you get your station running.

First, when you manage to connect to some other station and you are engaged in a QSO with him, packet operators in New England use a greater than symbol '>' to indicate that the transmitting station is done talking and wants the receiving station to talk. This is much like the KN prosign in CW. Sometimes operators will use multiple '>'s at the end of a transmission, but these mean the same thing. Packet does, however, ack just like full break in CW (QSK) in that the

receiving station can interrupt you mid thought if he wants to.

Second, when using a BBS station, and even for most person to person QSOs you should use the fewest number of digipeaters to complete the QSO as possible. If you don't, you tie up the frequency in a larger area for a longer amount of time. This can be related to talking up a long monologue on a repeater and timing it out. A mobile might have needed to use the repeater for an emergency while you were talking, or a station trying to work a friend direct will be prevented from doing so on packet because TNC's can't transmit on an occupied frequency. It's just not good operating practice.

Calling CQ is done in the unconnected mode. Digipeaters may be used. Just typing some characters like, 'Hello CQ... Anyone on?' will usually be adequate.

Beaconing is supported by most TNC's but is not presently considered good operating practice unless you wish to disperse some general info such as your new digipeater on frequency and then only for a limited amount of time. When beaconing, keep the beacons no closer than every hour or so. Calling CQ with beacons is not always a good idea because you may leave your station beaconing when you aren't around (beacons don't require an operator to be present).

Remember, when you are transmitting, nobody else can use that same frequency. if you use 5 digipeaters to talk to somebody, a packet is transmitted 6 times and acknowledged 6 times.

A packet channel on VHF can only support 3 or so simultaneous QSOs or 1 BBS user and 1 QSO. More users will work, but network delays may be to great to make effective communications.

I hope these thoughts will help any fledgling packet operators when they first get on packet.

The Spark Gap



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AMATEUR RADIO
SOCIETY**

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Wellesley, Ma. 02181



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FIRST CLASS MAIL

